4.)

(19) Europäisches Patentamt
European Patent Office
Office européen des brevets

(11) Publication number: **0 075 364**
A2

(12) EUROPEAN PATENT APPLICATION

(21) Application number: 82201140.9

(22) Date of filing: 15.09.82

(51) Int. Cl.³: E 05 D 15/10, E 06 B 3/50

(30) Priority: 17.09.81 IT 8561481

(43) Date of publication of application: 30.03.83
Bulletin 83/13

(84) Designated Contracting States: AT BE CH DE FR GB IT LI LU NL SE

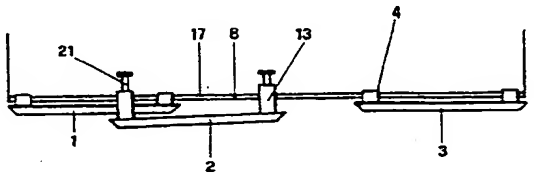
(71) Applicant: KAIROS S.N.C. DI M.BONETTI G.MANENTE E A.MION ING. & ARCH., Via Scortegara 64, I-30030 Mirano-Zianigo (Venezia) (IT)

(72) Inventor: Bonetti, Massimo, Via Peschiera 3, I-35100 Padova (IT)
Inventor: Manente, Giuseppe, Via Repetti 8, I-30170 Mestre Venezia (IT)
Inventor: Mion, Abramo, Via Scortegara 64, I-30030 Mirano Zianigo Venezia (IT)

(74) Representative: Piovesana, Paolo, Corso del Popolo, 70, I-30172 Venezia-Mestre (IT)

(54) Supporting and running device for sliding doors, particularly for furniture.

(57) The supporting and running device for sliding doors is characterized in that each door (1, 2, 3) is provided with at least one sliding frame (4, 5; 13, 14) along a guide rail (8, 12) distinct from the guide rails (17, 29) of the adjacent doors, said sliding frames, excluding at least those sliding along external rails (8, 12), being provided with means (21, 23; 27, 26) for the elastic displacement of the corresponding door from the position coplanar with the others.



EP 0 075 364 A2

0075364

The invention relates to a supporting and running device for sliding doors, particularly for furniture.

Well-known are supporting and running devices for sliding doors, particularly for furniture, provided with rollers applied to the upper edge of the doors and sliding along guides applied to the furniture frame.

With the aim of allowing opening of the doors and therefore their total or partial superimposition, they have to run on parallel planes: this implies, in the closed position, the formation of openings for entry of dust inside of the furniture and a not very agreeable outlook.

Aim of the invention is to realize a supporting and running device for sliding doors, which allows the doors themselves to be placed parallely facing when open and coplanarly aligned when closed.

Such an aim is attained according to the invention by a supporting and running device for sliding doors, particularly for furniture, comprising a number of sliding doors, which, when in closed position are placed coplanar among themselves and when in open position are superimposed, characterized in that each door is provided with at least one sliding frame along a guide rail distinct from the guide rails of the adjacent doors, said sliding frames, excluding

at least those sliding along the external rails, being provided with means for elastic displacement of the corresponding door from the position coplanar with the others.

Advantageously the adjacent doors can slide along two parallel guide rails.

Always according to the invention at least a rod for the reciprocal transversal displacement can be interposed between each sliding frame and the relevant door.

The invention is hereinafter further clarified with reference to the enclosed drawings in which:

Figure 1 shows in vertical section the supporting and running device for sliding doors according to the invention applied to a wardrobe with the doors coplanar (opened wardrobe),

Figure 2 shows it in the same view as Figure 1 with the doors superimposed (closed wardrobe),

Figure 3 shows it in partially sectioned view from above,

Figures 4 and 5 show it in schematic view from above and below respectively and in a smaller scale two doors during partial superimposition step,

Figures 6 to 8 show schematically in partial schematic view from above a furniture with three doors in three subsequent steps of opening of the middle door, and

Figures 9 and 10 show it in the same view in two subsequent steps of opening of a side door.

As can be seen from the figures, the device according to the invention can be used, for example, for wardrobes with sliding doors.

In the illustrated embodiment the doors are three and are indicated by the numerals 1, 2 and 3.

Both side doors 1 and 3 are provided near the horizontal edges with pairs of sliding frames 4,5.

Each upper sliding frame 4 comprises a metal supporting plate 6 for a horizontal axis roller 7 sliding on a longitudinal guide 8 externally applied on the horizontal upper edge of the wardrobe 9.

Each lower sliding frame 5 comprises a small supporting plate 10 of a vertical axis roller 11 sliding on a guide 12 applied near the lower edge of the wardrobe 9.

The middle door 2 is also provided, near its horizontal edges, with a pair of sliding elements 13,14. Each upper sliding frame 13 comprises a supporting bracket 15 for a roller 16 sliding along a longitudinal guide 8. In particular, to allow transversal displacements of the door 2 with respect to the guide 17, the bracket 15 is provided with two horizontal axis rollers 18 and 19 and a vertical

axis roller 20, which support and drive a rod 21 connected to the sliding frame 13.

Between the bracket 15 and a projection 22 connected to the rod 21 a solenoidal spring 23 is placed, having the role of elastically keeping the door 2 coplanar to the doors 1 and 3, when they are in closed position.

Each lower sliding frame 14 comprises a bracket 24 which at its end is provided with a pin 25 having a spring 26, to which a supporting lever 27 of a roller 28 is connected, the roller sliding on a guide 29 applied to the wardrobe and parallel to the guide 12.

Furthermore, the doors 1, 2 and 3 are provided on the upper part with a guide list 30 having rounded ends which help, as it will be better clarified, the transversal displacement of the door 2 with respect to doors 1 and 3 during their reciprocal movement.

Whereas, to the brackets 24 of the lower sliding frame 14 a guide list 31 is applied, against which the vertical axis rollers 32, applied to the brackets 10 of the sliding frames 5, leans. Analogously to the sliding frames 30, the list 31 is also provided with rounded ends.

The operating of the device according to the invention is as follows:

when in closed position, the doors 1, 2 and 3 are placed coplanar among themselves (cfr. Fig. 6) and completely close the wardrobe 9. This position is kept elastically stable by the action of the springs 23.

To open the middle area of the wardrobe, the middle door 2 is pushed from one side or the other (on the left in the embodiment, cfr. Fig. 7). Following such a push, the middle door 2 moves sideways by means of its rollers 16 sliding along the guide 17 and at the same time starts to move transversally so partially superimposing the lateral door 1.

Such superimposition is due to the fact that:

- on the upper part the rounded ends of the guide lists 30 foreseen on the doors 1 and 2 and faced in the opposite direction interreact between themselves causing the elastic lengthening of the spring 23 and the consequent transversal displacement of the door 2,
- on the lower part the rounded portion of the guide list 31 near the door 1, interreacts with the rollers 32 and, overcoming the reaction of the springs 26, allows the door 2 to elastically displace to the outside.

Continuing this push, the door 2 superimposes itself on the door 1 until it is parallely facing to this

(cfr. Fig. 8).

To close the wardrobe, the door 2 is pushed towards the right: continuing this displacement, the elastic reaction of the springs 23 and 26, that drawing back the bracket 15 and the bracket 24 respectively, prevails, these springs bring back the door 2, which is no longer engaged to the rods 30 and 31, in a coplanar position with the doors 1 and 3.

In the case that one needs to open one of the side areas of the wardrobe (the left in the embodiment), the side door 1 is pushed in the direction shown by arrow 33 in Figure 9. Also in this case the reciprocal engagement between the upper lists 30 and between the lower list 31 and the roller 32 causes displacement of the middle door 2 until the side door 1 is placed parallely facing to it (cfr. Fig. 10).

In such a way the device according to the invention allows an easy and quick operating of sliding doors, which, when in close position, remain coplanar among themselves, eliminating any opening for entry of dust and at the same time ensuring a pleasant aspect to the closed wardrobe.

C L A I M S

1. Supporting and running device for sliding doors, particularly for furniture, comprising a number of sliding doors (1,2,3), which, when in closed position are placed coplanar among themselves and when in open position are superimposed, characterized in that each door (1,2,3) is provided with at least one sliding frame (4,5;13,14) along a guide rail (8,12) distinct from the guide rails (17,29) of the adjacent doors, said sliding frames, excluding at least those sliding along the external rails (8,12), being provided with means (21,23;27,26) for the elastic displacement of the corresponding door from the position coplanar with the others.

2. Device according to claim 1 characterized in that the adjacent doors slide along two parallel guide rails (8,17).

3. Device according to claim 1 characterized in that at least a rod (21) for the reciprocal transversal displacement is interposed between each sliding frame (13) and the relevant door (2).

4. Device according to claim 1 characterized in that at least a roller guide (18,19,20) is associated to each rod (21).

5. Device according to one or more of claims 1 to 4 characterized in that at least a bracket (15), supporting guide rollers (18,19,20) for the rod (21) connected to the sliding frame (13), is applied to each door, and that at least a spring (23) is interposed between said bracket (15) and said rod (21).

6. Device according to one or more of claims 1 to 5 characterized in that at least an elastically articulated lever (27) is interposed between each door (2) an the relevant guide rail (29), said lever being connected at one end to the door (2) and provided at the other end with a roller (28) engaged with the guide rail (29).

7. Device according to one or more of claims 1 to 6 characterized in that each door (2) is provided with a pair of horizontal lists (30) cooperating with lists (30) foreseen in the adjacent doors (1,3) in order to cause the transversal reciprocal displacement.

8. Device according to claims 1 and 7 characterized in that the lists (30) have the ends rounded.

9. Device according to one or more of claims 1 to 6 characterized in that it comprises horizontal lists (3) applied to the doors (2) and cooperating with guide rollers (32) applied to the adjacent doors (1,3) in order to cause the reciprocal transversal displacement.

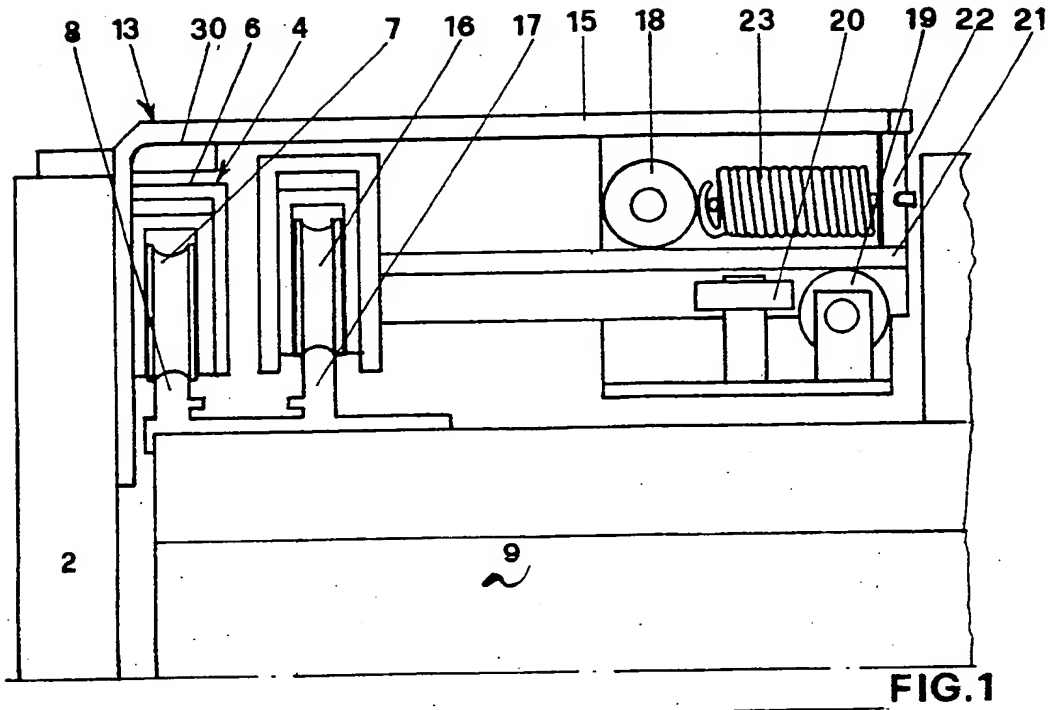
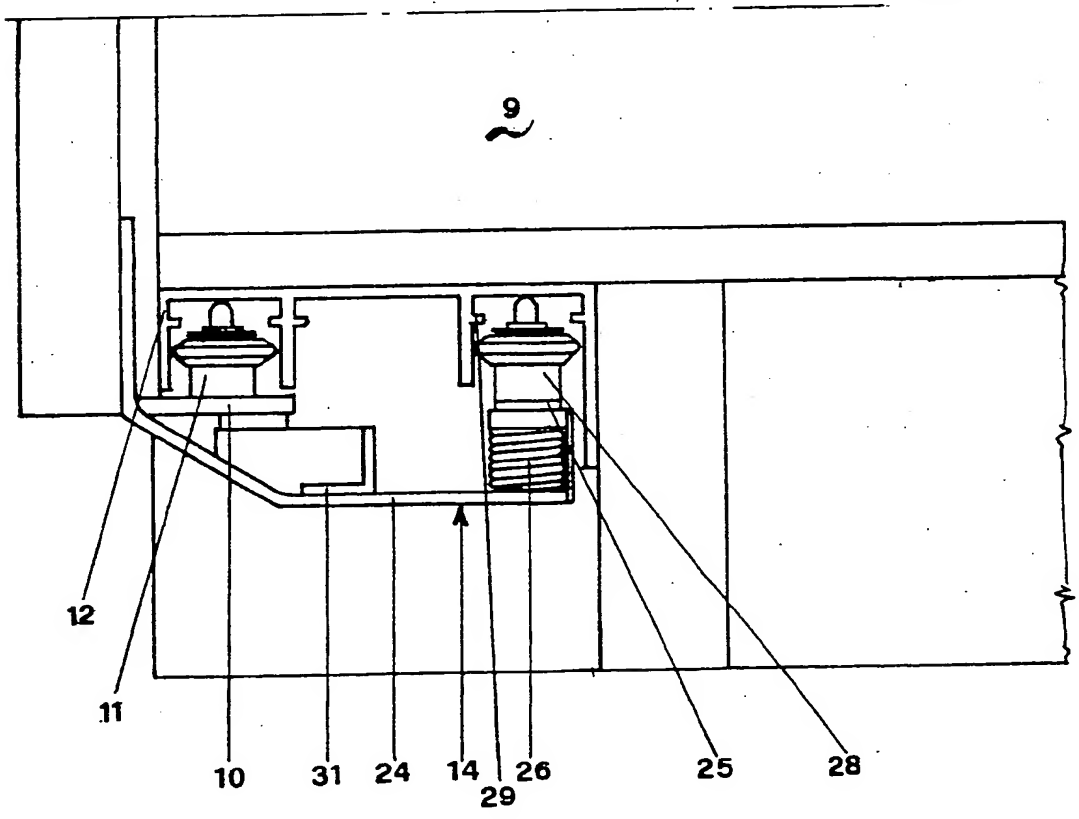


FIG.1



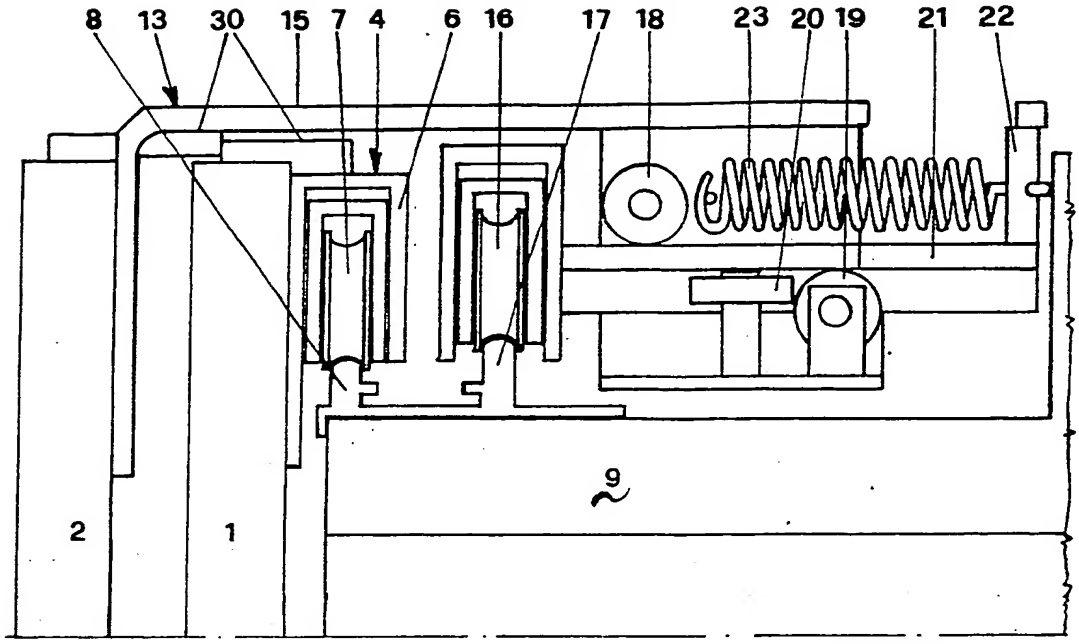
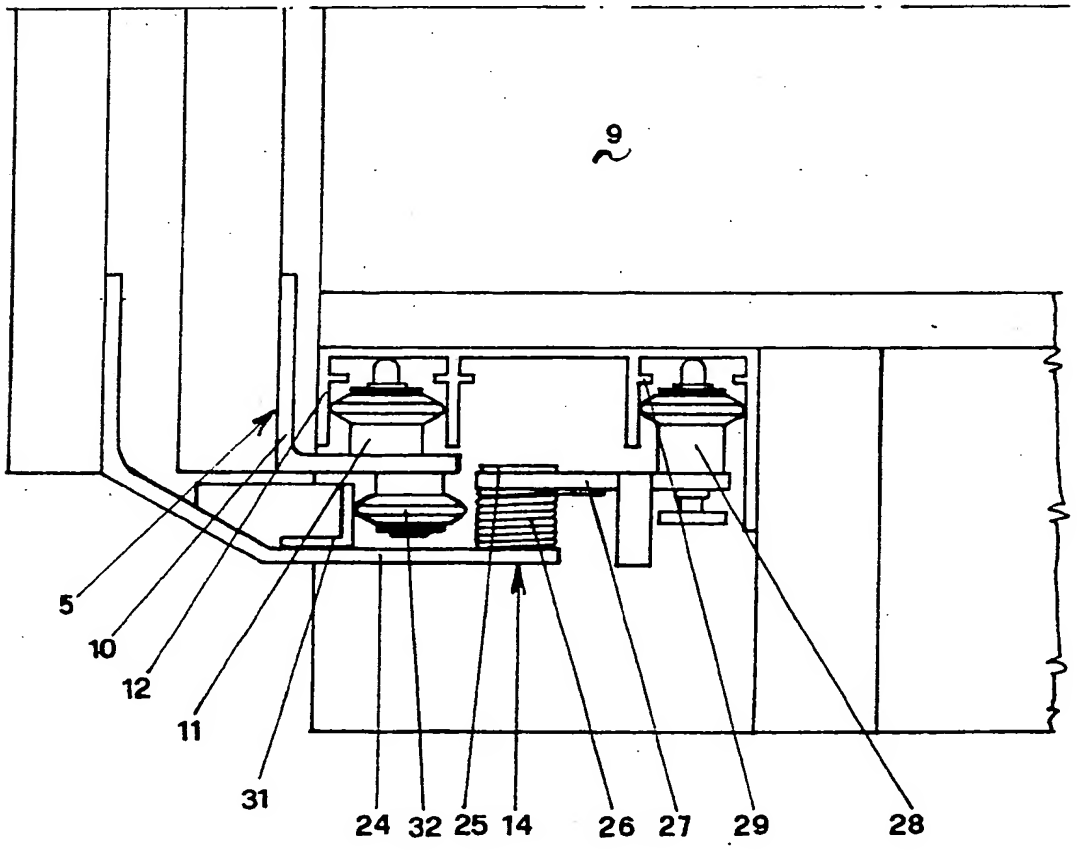

8
13
30
15
7
4
6
16
17
18
23
20
19
21
22
9
2
1

FIG. 2


9
5
10
12
11
31
24
32
25
14
26
27
29
28

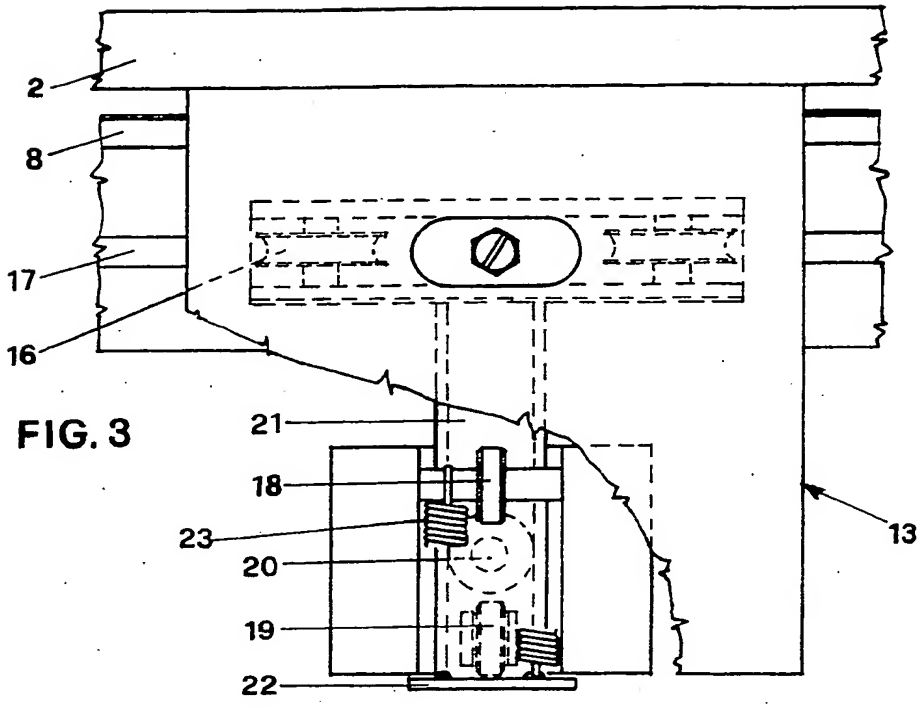


FIG. 3

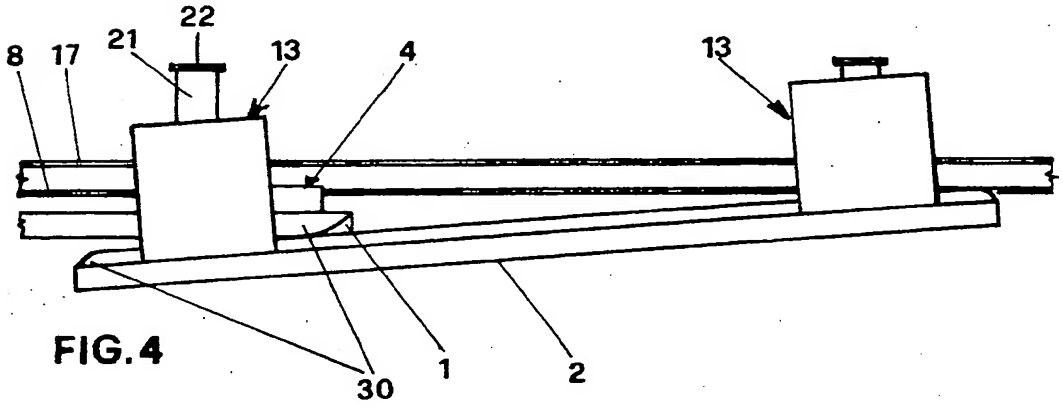


FIG. 4

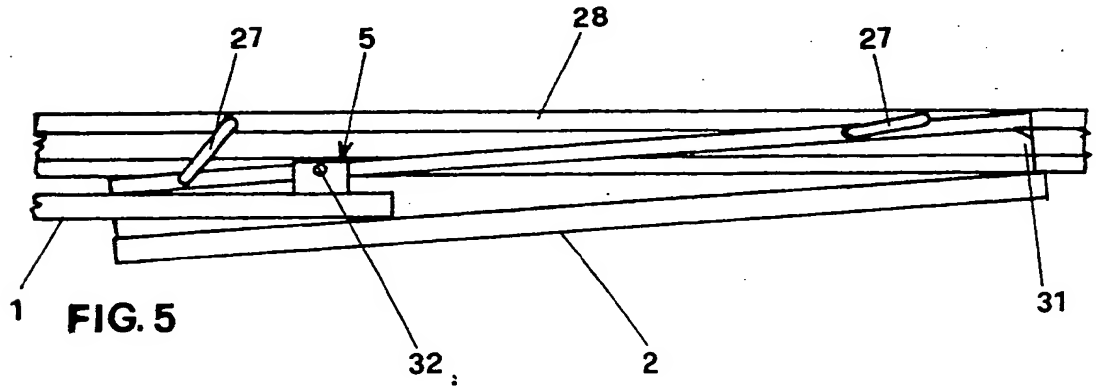


FIG. 5

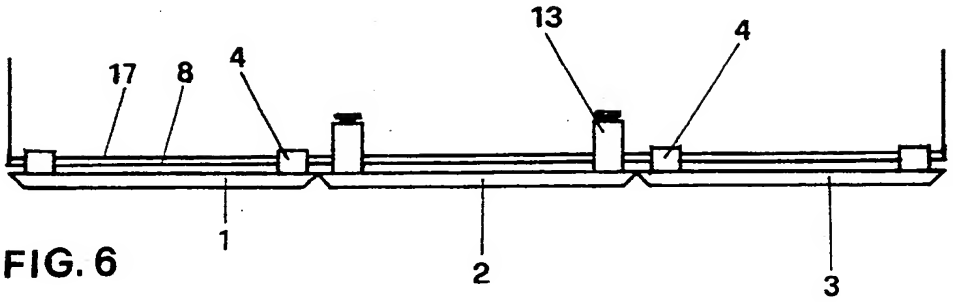


FIG. 6

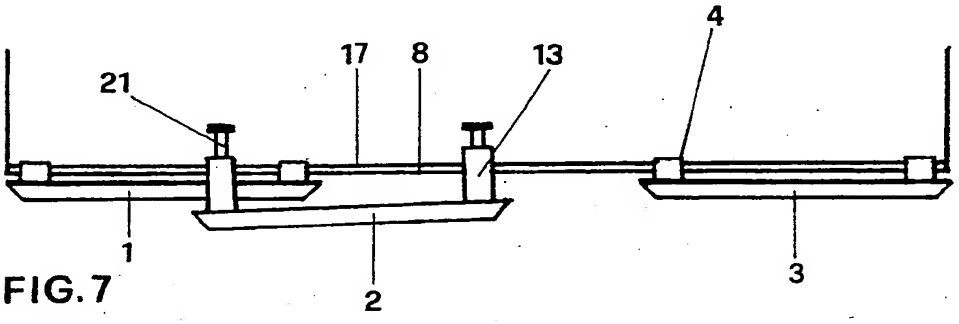


FIG. 7

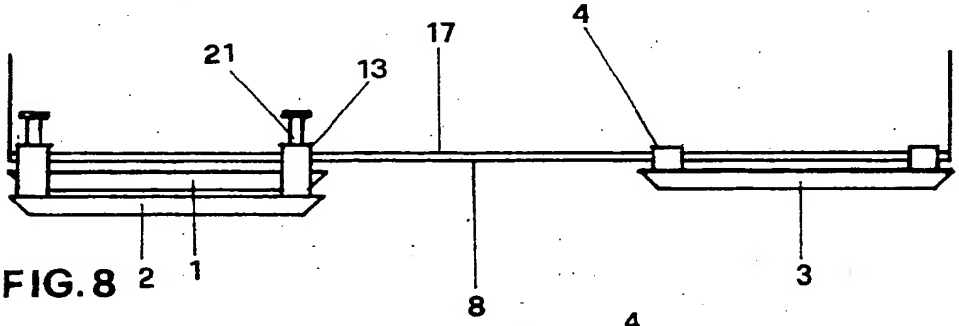


FIG. 8

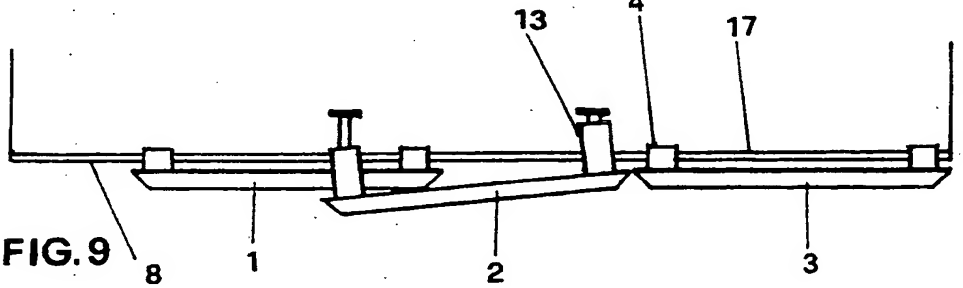


FIG. 9

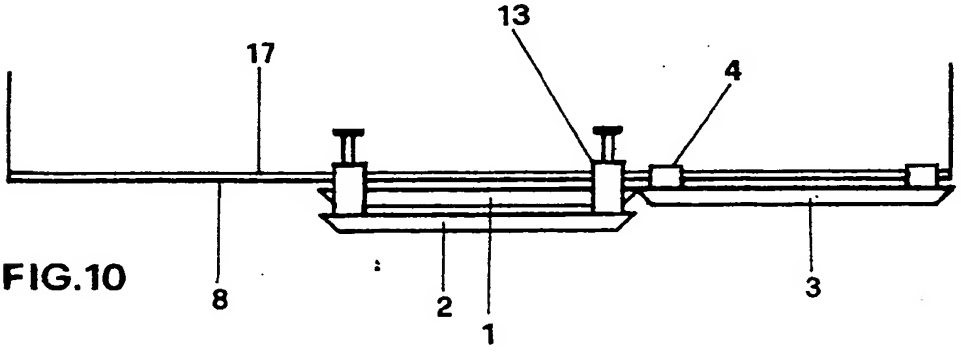


FIG. 10

(19) Europäisches Patentamt
European Patent Office
Office européen des brevets

(11) Publication number: **0 075 364**
A3

(12) # EUROPEAN PATENT APPLICATION

(21) Application number: **82201140.9**

(22) Date of filing: **15.09.82**

(51) Int. Cl.³: **E 05 D 15/10**, E 06 B 3/50

(30) Priority: **17.09.81 IT 8561481**

(43) Date of publication of application: **30.03.83**
Bulletin 83/13

(84) Designated Contracting States: **AT BE CH DE FR GB IT LI LU NL SE**

(88) Date of deferred publication of search report: **28.11.84 Bulletin 84/48**

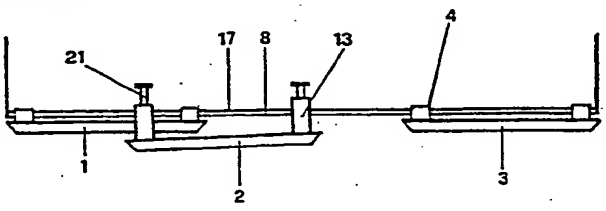
(71) Applicant: **KAIROS S.N.C. DI M.BONETTI G.MANENTE E A.MION ING. & ARCH., Via Scortegara 64, I-30030 Mirano-Zianigo (Venezia) (IT)**

(72) Inventor: **Bonetti, Massimo, Via Peschiera 3, I-35100 Padova (IT)**
Inventor: **Manente, Giuseppe, Via Repetti 8, I-30170 Mestre Venezia (IT)**
Inventor: **Mion, Abramo, Via Scortegara 64, I-30030 Mirano Zianigo Venezia (IT)**

(74) Representative: **Piovesana, Paolo, Corso del Popolo, 70, I-30172 Venezia-Mestre (IT)**

(54) **Supporting and running device for sliding doors, particularly for furniture.**

(57) The supporting and running device for sliding doors is characterized in that each door (1, 2, 3) is provided with at least one sliding frame (4, 5; 13, 14) along a guide rail (8, 12) distinct from the guide rails (17, 29) of the adjacent doors, said sliding frames, excluding at least those sliding along external rails (8, 12), being provided with means (21, 23; 27, 26) for the elastic displacement of the corresponding door from the position coplanar with the others.



EP 0 075 364 A3

European Patent Office

EUROPEAN SEARCH REPORT

0075364

Application number

EP 82 20 1140

DOCUMENTS CONSIDERED TO BE RELEVANT

Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (Int. Cl. ³)
X	US-A-3 510 983 (BARABAS) *Column 2, line 19 - column 3, line 45; figures 1-7*	1,2,3, 7,8	E 05 D 15/10 E 06 B 3/50
Y		4,5,6, 9	
Y	US-A-2 157 678 (SCHIELKE) *Page 1, column 2, line 26 - page 2, column 2, line 7; figures 1-8*	4,5	
A		1,3,6	
Y	DE-A-2 719 270 (KLÖCKNER-HUMBOLDT-DEUTZ) *Page 6, line 22 - page 11, line 1; figures 1-6*	6	TECHNICAL FIELDS SEARCHED (Int. Cl. ³)
Y	FR-A-1 219 364 (BONNET) *Page 2, column 1, line 1 - column 2, line 22; figures 1-9*	9	E 06 B E 05 D
A		1,7,8	
A	DE-B-1 272 501 (VOKO)		
A	FR-A-1 497 192 (KATO BODY)		

The present search report has been drawn up for all claims

Place of search	Date of completion of the search	Examiner
THE HAGUE	27-08-1984	DEPOORTER F.

CATEGORY OF CITED DOCUMENTS

X : particularly relevant if taken alone
Y : particularly relevant if combined with another document of the same category
A : technological background
O : non-written disclosure
P : intermediate document

T : theory or principle underlying the invention
E : earlier patent document, but published on, or after the filing date
D : document cited in the application
L : document cited for other reasons

& : member of the same patent family, corresponding document

EPO Form 1503. 03.82